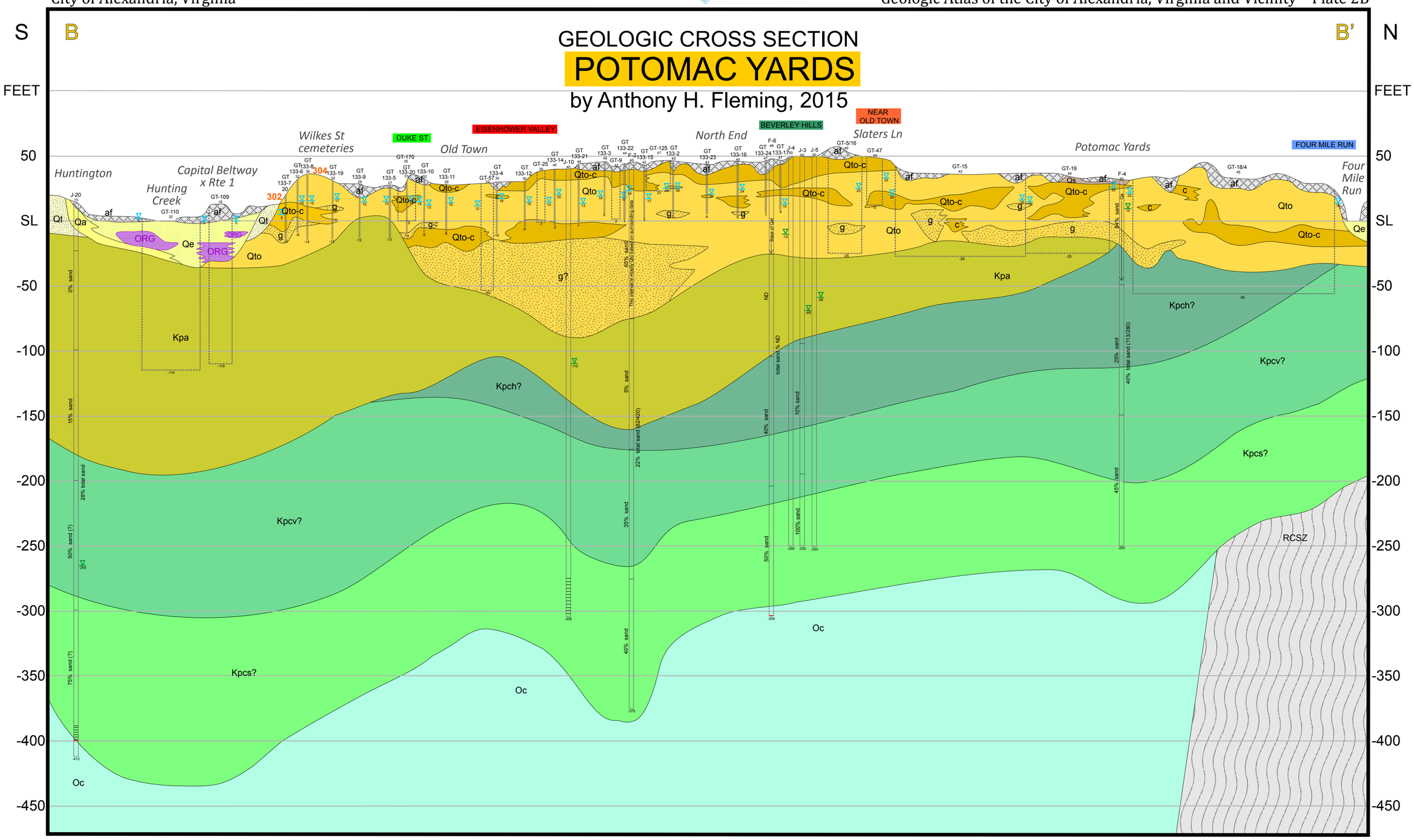
# GEOLOGIC CROSS SECTION

# POTOMAC YARDS

by Anthony H. Fleming, 2015




SEE PLATE 5 FOR EXPLANATION OF MAP UNITS

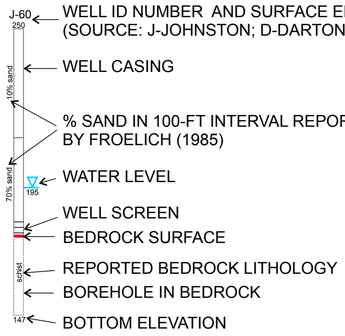
VERTICAL EXAGGERATION 20X

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

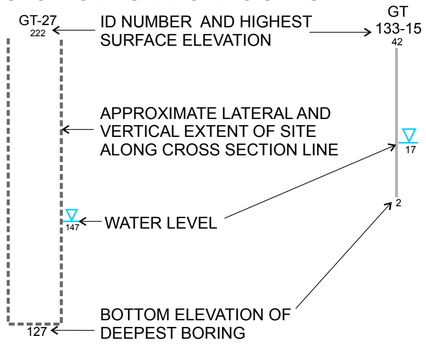
FEET

## EXPLANATION OF CROSS SECTION SYMBOLS:

### WATER WELL




### GEOTECHNICAL BORING SITES




### WATER LEVELS REPORTED IN WELLS AND GEOTECHNICAL BORINGS

- 119 — WATER LEVEL MEASURED IN WELL OR CASED GEOTECHNICAL BORING COMPLETED IN THE CAMERON VALLEY SAND (LOWER AQUIFER OF THE POTOMAC FORMATION)
- 132 — WATER LEVEL MEASURED IN 1976 FROM WELL COMPLETED IN CAMERON VALLEY SAND (JOHNSTON AND LARSON, 1977)
- 210 — WATER LEVEL MEASURED IN WELL OR GEOTECHNICAL BORING COMPLETED IN OTHER AQUIFERS. MAY REPRESENT A COMPOSITE OR AVERAGE WATER LEVEL AT GEOTECHNICAL SITES WITH MANY BORINGS

### OTHER SYMBOLS

- 47 — SURFACE EXPOSURE. SOME EXCAVATIONS COINCIDE WITH GEOTECHNICAL BORING SITES
- g — GRAVELLY ZONES IN THE OLD TOWN TERRACE REPORTED IN GEOTECHNICAL BORINGS
- ORG — ORGANIC ZONES REPORTED IN GEOTECHNICAL BORINGS FROM THE POTOMAC FORMATION, QUATERNARY ALLUVIUM, AND OTHER SEDIMENTS. INCLUDES WOOD, PEAT, LIGNITE, LEAVES, DARK ORGANIC SILT, AND OTHER ORGANIC MATERIAL
- DUKE ST — INTERSECTION WITH ANOTHER CROSS SECTION. CROSS SECTIONS ARE DISTINGUISHED BY NAME AND COLOR-CODED SECTION LINES AND TITLES

**GEOLOGIC CROSS SECTION 2B– POTOMAC YARDS**

Cross section 2B extends northward from Cameron Run, at Huntington, to the mouth of Four Mile Run near George Washington Memorial Parkway. The section traverses the entire length of the Old Town terrace within the City, following the Payne-Fayette Street corridor northward through Old Town, before taking in the bulk of Potomac Yards – an area whose landscape and soil profile were seriously altered (and contaminated) by more than a century of railroad activity before being remediated and redeveloped in recent decades.

The perspective of the section line, together with dense concentrations of high-quality geotechnical borings along much of its length, afford a comprehensive look at the longitudinal architecture of the Old Town terrace, as well the two major estuaries (Four Mile Run, Hunting Creek-Cameron Run) that bound the terrace on the north and south, respectively. The alignment of borings along major thoroughfares and the old railroad corridor results in a relatively straight north-south section line. Locations of geotechnical boring sites, historical water wells, and other features of interest (e.g., the historical Wilkes St. cemeteries) are indicated by labels and symbols along the cross section. The specific location of the cross section is indicated on Plate 1 by a deep yellow section line.

The cross sections are intended to be used together with the other maps, particularly Plate 5, to illustrate the third dimension of the map units and their relations to landforms and water resources. Contacts between map units are approximately located; the abundance of control points (surface exposures, wells, geotechnical sites) along the cross section provides a general indication of the reliability of contact locations. Map units are depicted using the same colors, patterns, and labels as on Plate 5, and the explanation of map units on Plate 5 serves as the legend. The section also depicts some bedrock units, thick organic zones, and gravelly bodies in the Old Town terrace that are present only in the subsurface, and thus do not appear on Plate 5.

Major physiographic features include the relatively level and undissected surface of the Old Town terrace, and the low-lying estuaries at either end. All of these landscapes have been severely altered by centuries of human habitation, with most places being covered by thick artificial fill of multiple generations and heterogeneous composition. The present-day appearances of tidal Four Mile Run and Hunting Creek bear little resemblance to their historical character: their formerly broad estuarine marshes, which trapped nearly all of the sediment load carried by these streams – sediment that now goes straight into the river, and ultimately the Chesapeake Bay – are now largely buried by fill, while the streams themselves are contained within massive artificial levees that effectively prevent any hydraulic communication with their floodplains. While only tiny fragments of this once-rich ecosystem remain, the thick, peat-bearing deposits beneath them record thousands of years of estuarine deposition prior to European settlement.

The Potomac Yards section illustrates at least two important features of the Old Town terrace. The first is a general upward-fining in grain size, with the majority of gravelly zones reported in geotechnical borings being found in the lower part of the unit, while silty-clay bodies tend to be concentrated in the upper part. Some of the silty clay bodies contain wood, leaves, and other organic matter, suggestive of buried soil profiles and multiple periods of alluviation during the Pleistocene.

Second, the base of the terrace is broadly undulating, with gravel units locally concentrated in sags and swales, and a deep central channel that trends obliquely through the middle of the cross section. This large channel appears in other nearby cross sections and is inferred to be mostly gravel filled, based on sparse geotechnical borings that penetrate that far below the surface. The thickness of the Old Town terrace appears to be in excess of 125 feet in the axis of the channel; though the geologic details of the channel fill are little explored, most of this thickness appears to be saturated, suggesting the potential for major ground-water yields, perhaps comparable to those historically derived from large-diameter wells screened in the base of the Potomac Formation below Old Town.

Several of these historical Potomac Formation wells appear on the cross section; every one of them terminates in the lowermost part of the formation, in the interval termed the Cameron Valley sand member (Kpcs) in this atlas. This relation strongly suggests that the thick sequence of sandy strata observed further to the west, where the base of the formation crops out, continues in the downdip part of the formation far below the modern land surface.